

ABSTRACT

A method for deriving barycentric coordinates for a point \mathbf{p} within an n-sided polygon is provided wherein, for a particular coordinate w_j , corresponding to the vertex \mathbf{q}_j , the method embodies a formula which depends only on the edge \mathbf{pq}_j , and the two adjacent angles δ_i and γ_j . Similarly, a method is provided for deriving weights w_{ij} for expressing a vertex \mathbf{q}_i in a mesh representation of an object surface in terms of its one-ring neighbors \mathbf{q}_j , $\forall j \in N(i)$. For a particular vertex \mathbf{q}_j , and neighbor vertex \mathbf{q}_i , this method embodies a formula which depends only on the edge \mathbf{q}_iq_j , and the two adjacent angles δ_j and γ_i . A method of parameterizing a mesh representation of an object surface using the latter formula is also provided. This method begins with the step of computing the weights w_{ij} in 3D space (in contrast to parameter space) for each of the vertices in the mesh representation. For a vertex i , $i \in [1 \dots n]$, the weights w_{ij} allow the vertex i to be expressed in terms of its one-ring neighbors $j \in N(i)$. The method then proceeds to parameterizing the mesh representation responsive to the weights w_{ij} .